

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application.

IN THE CLAIMS:

1 1. (currently amended) A chromatography column
2 having a column tube and end filter arrangements which,
3 in use, retain a bed of particulate chromatography
4 medium in the column tube between them while allowing
5 the passage of fluid for chromatography;
6 at least one of the end filter arrangements being
7 at the front end of a plunger which is axially slidable
8 along inside the column tube, makes a seal outwardly
9 against the tube and incorporates an internal flow
10 conduit communicating along the plunger between a
11 permeable filter portion of the respective end filter
12 arrangement and a rear part of the plunger outside the
13 column tube;
14 the plunger comprising a tubular stem of glass or
15 thermoplastic material which defines in one piece said
16 internal flow conduit including an integral front
17 divergent portion, the permeable filter portion being
18 integrally bonded to the front end of the tubular stem
19 across the front divergent portion of the internal flow
20 conduit to form an internal distribution space, and an
21 outer plunger wall spaced outwardly from said tubular

22 stem ~~defining~~ at locations rearward of the front
23 divergent portion of the internal flow conduit, the
24 outer plunger wall and tubular stem being integrally
25 bonded to one another ~~at the front end of the plunger~~
26 around said tubular stem at the front divergent portion
27 so as to seal off an internal space at the front end of
28 the plunger, ~~around said tubular stem, at the front end~~
29 thereof.

1 2. (original) A chromatography column according
2 to claim 1 in which the filter portion is integrally
3 fused to the plunger stem.

1 3. (previously amended) A chromatography column
2 according to claim 2 in which both stem and filter
3 portion are of glass or thermoplastics material.

1 4. (original) A chromatography column according to
2 claim 1 in which the tubular stem extends as a
3 one-piece integral whole back to a rear connection
4 union at the rear of the plunger.

1 5. (original) A chromatography column according
2 to claim 4 in which the rear connection union has a
3 joint boundary at the exterior of the plunger stem.

1 6. (previously amended) A chromatography column
2 according to claim 1 in which an outwardly-directed
3 sealing portion at or adjacent the front end of the
4 plunger which makes a seal directly against the column
5 wall, or which mounts a deformable seal element for
6 making such a seal, is joined to the permeable filter
7 portion via a one-piece integral structure.

1 7. (original) A chromatography column according to
2 claim 6 in which the permeable filter portion is bonded
3 to the plunger's outer wall by being integrally fused
4 therewith.

8. (previously cancelled).

1 9. (previously amended) A chromatography column
2 according to claim 1 in which one end of the column
3 tube has a full-diameter opening receiving the plunger
4 and the other end is a closed end, converging to a
5 union for an external fluid flow conduit and having a
6 fixed permeable filter element across the column tube
7 adjacent the closed end.

1 10. (previously presented) A chromatography
2 column according to claim 1 in which the tubular stem
3 and outer plunger wall are transparent.

1 11. (currently amended) A chromatography column
2 having a column tube and end filter arrangements which,
3 in use, retain a bed of particulate chromatography
4 medium in the column tube between them while allowing
5 the passage of fluid for chromatography;
6 at least one of the end filter arrangements being
7 at the front end of a plunger which is axially slidable
8 along inside the column tube, makes a seal outwardly
9 against the tube and incorporates an internal flow
10 conduit communicating along the plunger between a
11 permeable filter portion of the respective end filter
12 arrangement and a rear part of the plunger outside the
13 column tube;
14 the plunger comprising a tubular glass stem which
15 defines said internal flow conduit including an
16 integral front divergent portion, the permeable filter
17 portion being a sintered glass element integrally fused
18 to the plunger stem around said tubular stem at the
19 front divergent portion so as to seal off an internal
20 distribution space at the front end of the plunger.

21 12. (currently amended) A chromatography column
22 according to claim 11 in which the plunger further
23 comprises an outer plunger wall spaced outwardly from
24 said tubular stem ~~defining the internal flow conduit at~~ at

25 locations rearward of the divergent portion, the outer
26 plunger wall and tubular stem being integrally bonded
27 to one another at the front end of the plunger ~~so as to~~
28 ~~seal off an internal space of the plunger, around said~~
29 ~~tubular stem, at the front end of the plunger.~~

1 13. (previously presented) A chromatography
2 column according to claim 12 in which the outer plunger
3 wall has a cylindrical sealing portion whose outer
4 surface makes a fitting seal against the column tube
5 interior.

1 14. (previously presented) A chromatography
2 column according to claim 13 in which the cylindrical
3 sealing portion is axially elongate and constitutes the
4 means for aligning the plunger axially in the column
5 tube.

1 15. (previously presented) A chromatography
2 column according to claim 12 in which the plunger
3 comprises a sealing ring fitting around the outer
4 plunger wall to seal against the column tube wall.

1 16. (previously presented) A chromatography
2 column according to claim 13 in which the plunger

3 comprises a sealing ring fitting around the outer
4 plunger wall to seal against the column tube wall.

1 17. (previously presented) A chromatography
2 column according to claim 11 in which one end of the
3 column tube has a full-diameter opening receiving the
4 plunger and the other end is a closed end, converging
5 to a union for an external fluid flow conduit and
6 having a fixed permeable filter element across the
7 column tube adjacent the closed end.

1 18. (previously presented) A chromatography
2 column according to claim 14 in which one end of the
3 column tube has a full-diameter opening receiving the
4 plunger and the other end is a closed end, converging
5 to a union for an external fluid flow conduit and
6 having a fixed permeable filter element across the
7 column tube adjacent the closed end.

1 19. (currently amended) A chromatography column
2 comprising a column tube and a self-aligning plunger
3 axially slidably receivable in the column tube;
4 the column tube having a first end with a full-
5 diameter opening closed by removably receiving the
6 plunger and a second, closed end converging to a union
7 for an external fluid flow conduit;

8 a fixed permeable filter element being provided
9 across the column tube adjacent the second, closed end,
10 to retain in use one end of a bed of particulate
11 chromatography medium in the column tube while allowing
12 the passage to said union of fluid for chromatography;
13 the plunger having a front end slidable inside the
14 column tube and a rear end outside the column tube, the
15 front end of the plunger comprising a further permeable
16 filter element which retains in use the other end of a
17 said bed of particulate chromatography medium in the
18 column tube, and the rear end of the plunger having a
19 rear fluid connection union;
20 the plunger comprising a tubular stem of glass or
21 thermoplastic material which defines in one piece an
22 internal flow conduit extending in the plunger from the
23 rear fluid connection union to the permeable filter
24 element, and having an integral front divergent portion
25 across which the permeable filter element is disposed,
26 the plunger further comprising an outwardly-directed
27 sealing portion making a slidable seal engagement
28 against the column tube wall, with an alignment
29 structure of the plunger making an axially-elongate
30 fitting engagement with the column tube wall to align
31 the plunger axially in the column tube;
32 the plunger's permeable filter element being of
33 glass or thermoplastic material and integrally bonded

34 around so as to seal off an internal distribution space
35 at the front end of the plunger.

1 20. (previously presented) A chromatography
2 column according to claim 19 in which the column tube
3 and plunger are transparent.

1 21. (previously presented) A chromatography
2 column according to claim 19 in which the column tube
3 and plunger are of glass.

1 22. (currently amended) A chromatography column
2 according to claim 19 in which said alignment structure
3 of the plunger is provided by an outer cylindrical
4 plunger wall spaced outwardly from said tubular stem at
5 locations rearward of the divergent portion, the outer
6 plunger wall, tubular stem and permeable filter element
7 being connected to one another by integral fusing of
8 their glass or thermoplastic material to seal off an
9 internal space of the plunger, ~~around said tubular~~
10 ~~stem, at the front end of the plunger.~~

11 23. (previously presented) A chromatography
12 column according to claim 19 in which the plunger has a
13 machined glass surface fitting and sealing directly
14 against the column tube wall.

1 24. (previously presented) A chromatography
2 column according to claim 19 in which the
3 outwardly-directed sealing portion includes a rubber
4 sealing ring.